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Permission is granted to reprint articles from COMPUTERNEWS for noncommercial purposes provided the author, publication and issue are acknowledged.

The following article was taken from a letter which was recently sent to all University of Toronto Computer Centre users by Rein Mikkor, Acting Director of UTCC.

THE ADVISORY COMMITTEE RECOMMENDATIONS

The Advisory Committee on Computing Facilities and Services (ACCFS) is a committee consisting of members of the University computing community. The Director of the Computer Centre is one of the members of the Advisory Committee. The task of the ACCFS is to review policies and to make recommendations to the University Administration with respect to computing facilities and services in light of the University´s general and divisional objectives.

Over the past year and a half the ACCFS has discussed and analyzed numerous alternatives for re-equipment of UTCC facilities to meet the needs of the University´s computing community for the next several years.

The current UTCC facilities consist of:

- one IBM S/370-165-II which supports most academic computing (General Purpose Job Stream, High Speed Job Stream, and TSO).

- one IBM S/370-155-II which supports Business and Student Information Systems. The 155 administrative information systems provide financial, personnel, and student records information processing services for the University.

- one IBM S/360-65 which supports interactive computing (SHARP APL and ATS).

Several specific needs were identified:

- the 155-II is overloaded and has insufficient computing capacity to effectively handle the load during peak periods. No additional capacity exists for growth or needed development.

- the University lacks an effective general purpose time-sharing machine. TSO does not satisfy the requirements for a good, fast, relatively inexpensive, time-sharing service for general use. SHARP APL, although highly reliable and responsive, does not fulfill the general purpose requirements for the time-sharing service.

- the three UTCC facilities situated in three different locations using three different operating systems is costly from an operating point of view and prevents more effective use of the available computing services and computing capacity.

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THE ADVISORY COMMITTEE RECOMMENDATIONS cont´d

The Advisory Committee recommended the following course of action which will be of benefit to all the users of UTCC facilities and services:

- to acquire a second S/370-165-II to provide the needed increase in IBM processing capacity.

- to acquire another computer to provide general purpose time-sharing services.

- to sell the 155-II and 65.

- to consolidate the three computers in the Sandford Fleming Building.

The Second 165

The decision to acquire a second 165-II was arrived at after considering a number of other alternatives including an IBM S/370-158, IBM S/370-168, and an AMDAHL 470.

The 165-II was chosen for several reasons. It was a very cost effective alternative and would provide the required increase in IBM computing capacity to meet our projected needs.

The dual 165-II processor configuration would provide back-up capability for critical services. The installation of a second 165-II system would permit the orderly migration to a common operating system and the eventual integration of academic and administrative computing services.

Consolidation

The second 165-II will be installed in the Sandford Fleming Building sometime in May or June of 1977. The Business and Student Information systems will be transferred to this system and the 155-II will be sold.

The present 165-II will be upgraded from the MVT operating system to the MVS (Multiple Virtual Storage) operating system in June or July 1977. Over the past two years, since our last attempt to run MVS in January 1975, IBM has extensively re-written the operating system to improve its performance. The results of our recent benchmarks, which will be published in the January 1977 issue of COMPUTERNEWS, indicate that MVS performance is equivalent to MVT.

The second 165-II is targeted to be upgraded from the VS1 Virtual Storage operating system to MVS in November or December 1977. With both 165-II´s running under a common MVS operating system the load between the two machines can be more evenly distributed. The benefits of the increased computing capacity will be shared by both our academic and administrative users.

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THE ADVISORY COMMITTEE RECOMMENDATIONS cont´d

The 65

The installation of a new time-sharing machine does not imply the replacement of existing interactive services or the immediate sale of the 65.

The ATS service on the 65 can be moved to run on one of the 165-II´s under MVS. The SHARP APL service cannot be moved as easily. The major problem is the conversion of the SHARP file subsystem to run under MVS. There are some installations that apparently have made some progress in this area and we will be contacting them.

The 65 will remain until a satisfactory solution is found to provide an equivalent APL service on one of the other UTCC systems.

The Time-Sharing Machine

The ACCFS recommended that the Computer Centre acquire a new machine for general purpose time-sharing. The time sharing computer is intended to be used for time-sharing only. Batch processing will continue to be performed on the IBM 165-II´s. There will be a remote job entry interface between the time-sharing machine and the IBM systems to permit the submission of jobs from the time-sharing system to the IBM batch service.

The general characteristics that the time-sharing system should satisfy are listed below:

- -the time-sharing system must be reliable, provide good response, and support a large number of users at reasonable cost. The system should support a wide range of different interactive terminals. The system should be easily expandable to accommodate growth.

- -the system command language must be easy to learn and to use. The system must have a good text editor. The file management system must be easy to use and provide good data security.

- -the system must support a diversity of languages and applications. A wide range of programs, languages, and applications should be available for the system from other universities and research institutions.

The decision regarding the acquisition of a time-sharing machine will be made in the next several months and installation of the machine could be as early as the summer of 1977.

MVS RELEASE 3.7 BENCHMARKING RESULTS - JANUARY 1977

A series of benchmarks, comparing the MVT 21.7 and the recently released MVS 3.7 operating systems, was run at the University of Toronto Computer Centre during January 1977. These benchmarks show that MVS 3.7 is significantly better than all previous releases of MVS and comes to within 15% of the performance of UTCC´s current MVT system under a simulated load. They also show that the 4th megabyte contributes to the improved performance.

This article defines the benchmarking streams used and what they measured and describes the system they were run on. Results from July 1975 benchmarks are reviewed and the January 1977 results are presented. The conclusions indicate that MVS performance can be made roughly equal to that of UTCC´s current MVT system.

HARDWARE

IBM 370 model 165-II with
- 4 megabytes of main storage
- 16K high speed buffer
- High speed multiply
- two selector channels
- two block multiplexor channels

OPERATING SYSTEMS

a) OS/MVT and Hasp with
- 2 regions for TSO
- EXECUTOR
- Execution batch monitor (High Speed Job Stream)
- no accounting

b) MVS Rel 3.7 with
- Scheduler, Supervisor I and Supervisor II performance improvements
- JES2 R2
- Execution Batch Monitor (no SMF records)
- no accounting
- untuned

BENCHMARKING STREAMS

The benchmarking streams consist of three components: HSJS, Batch and TSO. These streams were constructed July 1975 to make MVS behave as observed in the January 1975 MVS production environment. Essentially the same streams were used in the July 1975 experiments and the January 1977 experiments.

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MVS RELEASE 3.7 BENCHMARKING RESULTS

cont´d

a) Batch
- 51 jobs (FORTRAN, PLI, utilities, Applications)
- 41 EXCP/CPU sec (average)
- 850 EXCP/job (average)
- 35% of EXCP are VIO under MVS

b) HSJS
- 308 jobs
- 45% WATFIV, 40% PLC
- 0.64 processor load per job (average)

c) TSO
- 25 terminals simulated (950 transactions)
- 18 sec average think time
- typical script determined by tracing MVT production (dataset editing, foreground compile, CLISTS)

d) System Tasks - (JES, accounting, displays, etc.) are represented by varying 300K of main storage offline under MVS, and by varying 500K of main storage offline under MVT. (only in January 77 experiment)

The exerciser does not include system tasks besides SMF recording. Only partial attention was given to distributions of job CPU time and EXCP count.

EXPERIMENTAL DESCRIPTION

1. What Was Measured

El. time HSJS (sec) - elapsed time in seconds to process all HSJS jobs
El. time Batch (sec) - elapsed time in seconds to process all Batch jobs
El. time TSO (sec) - elapsed time in seconds until the simulated TSO user logged off
CPU busy (sec) - # of seconds that the CPU was busy
Prob. State (sec) - # of seconds that the CPU was in problem state
Inst. Count (mil) - millions of instructions executed
HSB Miss (mil) - millions of accesses to main memory where contents are not found in High Speed Buffer
HSB Access (mil) - millions of storage accesses
HSB Hit Ratio % - HSB Miss/HSB Access
Instruction Rate (MIPS)- millions of instructions/second = Inst. Count/CPU busy
Pb/CPU ratio % - Prob. State/CPU busy
CPU busy % - CPU busy/(greatest elapsed time)

2. Differences Between July 75 and January 77 Experiments:

a. The Batch jobstream used in January 1977 appeared to be shorter than the July 1975 jobstream due to modifications of the jobstream as indicated by # of problem state seconds.

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MVS RELEASE 3.7 BENCHMARKING RESULTS

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b. Location of system datasets may have changed in the interval July 1975 - January 1977. Pack layout in Channels 3 and 4 in the January 1977 experiments differ from the July 1975 experiments. Channel balancing and dataset location will primarily impact elapsed time. We suspect that the January 1977 MVT configuration was less optimal than the July 1975 configuration.

c. Number of initiators in the July 1975 series could not be determined. Thus the initiator configuration probably differed in the two series. Over-initiation can lead to increased resource contention, whereas under-initiation can lead to under utilization of system resources.

d. The July 1975 benchmarks were performed with UTCC´s TSO simulator whereas the January 77 benchmarks were performed using TIOS, a similar TSO simulator from BOEING Computing Services.

3. Repeatability

Repeatability within the current series of benchmarks was examined by performing some experimental runs more than once. In general, elapsed times varied ±5% for a full benchmark (HSJS, Batch and TSO). CPU busy, problem state, instruction counts, High Speed Buffer hit and misses vary less than ±1%.

JULY 1975 BENCHMARKS

In July 1975 G. Milandre ran benchmarks on the 165-II with 3 megabytes of memory to assess the impact of potential hardware upgrades. MVS Rel 3.0 was used at that time. The chart below compares the MVT 21.7 system with the MVS 3.0 system.

	MVT 21.7	MVS 3.0	%
El. time HSJS (sec)	910	1850	203.3
El. time Batch (sec)	1797	2440	135.8
El. time TSO (sec)	1723	1540	89.4
CPU busy (sec	1519	2062	135.7
Prob. State (sec)	840	819	97.5
Inst. Count (mil)	3826	4131	108.0
HSB Miss (mil)	155	296	132.9
HSB Access (mil)	5473	5822	106.4
HSB Hit Ratio %	97.2	95.2	
Instruction Rate (MIPS)	2.51	2.00	
Pb/CPU ratio %	55.3	39.7	
CPU busy %	84.5	85.5	

At this time one could see that Batch and HSJS throughput were significantly degraded, TSO response was better, and in general MVS 3.0 used 135.7% of the MVT CPU busy time.

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MVS RELEASE 3.7 BENCHMARKING RESULTS

cont´d

Milandre´s final conclusion at that time was:

"In our environment, a conversion to MVS with equal system performance requires all of:

1) increased CPU power (35%)
2) increased main storage size (500K to 1 meg)
3) improvement of MVS control on address spaces to ensure a given level of service (turnaround and response time)
4) increased computing cost to TSO users (2.5 times)

Note that:

1) Increasing main storage size does not decrease the additional requirement for CPU that TSO presents under MVS.

2) Batch throughput is very dependent on the level of contention for main storage."

JANUARY 1977 RESULTS

In January 1977, UTCC ran benchmarks on the 165-II with 4 megabytes in order to assess the feasibility of moving to MVS. Over 40 benchmarking runs were done to evaluate the effect of various memory, channel and initiator configurations on MVT and MVS. Some runs include all three components (HSJS, Batch, TSO); others include only TSO, only HSJS, or only Batch and HSJS. The chart below compares MVT 21.7 in 4 megs to MVS 3.7 in 4 megs.

	MVT 21.7	MVS 3.7	%
El. time HSJS (sec)	1012	1330	131
El. time Batch (sec)	1892	2032	107
El. time TSO (sec)	1879	1634	87
CPU busy (sec)	1479	1696	115
Prob. State (sec)	786	768	98
Inst. Count (mil)	3674.5	3544	96
HSB Miss (mil)	155	222	143
HSB Access (mil)	5278	4990	95
HSB Hit Ratio %	97.1	95.5	
Instruction Rate (MIPS)	2.48	2.09	
Pb/CPU ratio %	53.1	45.3	
CPU busy %	78.2	83.5	

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MVS RELEASE 3.7 BENCHMARKING RESULTS

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SUMMARY

In the two years since UTCC last attempted to move to an MVS operating system, MVS has matured considerably. The performance study indicates that:

1. The MVS 3.7 with 4 meg results are very encouraging compared with the July 1975 results. They show that the addition of the 4th megabyte and the move from MVS release 3.0 to MVS release 3.7 with performance enhancements, has significantly improved the overall performance of MVS. Batch elapsed time is only 7% longer in MVS 3.7 than in MVT; CPU busy is 15% more in MVS. TSO is more responsive; its elapsed time is 13% less in MVS.
2. MVS 3.7 in 4 megs to MVS 3.7 in 3 meg experiments show that the 4th megabyte decreases Batch and HSJS elapsed time by 8% and 19% under MVS. In addition, CPU overhead is decreased by 7% with the addition of the 4th megabyte.
3. Total CPU time is still 15% greater in MVS than MVT and HSJS and Batch elapsed time is 31% and 7% greater.
4. TSO only comparisons with 25 simulated users show that TSO requires about 84% more CPU seconds in MVS, but with an elapsed time decrease of about 15%.
5. HSJS only comparisons show that HSJS resource requirements are comparable under MVS and MVT.

These preliminary results are encouraging, but they do indicate the need for further work in the following areas in order to make the MVS system perform equal to MVT:

a) UTCC has for some time been working on a Processor Speed-up Unit (PSU) which will effectively decrease total CPU time from 5-15% by decreasing memory access time for every High Speed Buffer Miss. Since MVS tends to miss the High Speed Buffer more frequently than MVT, its effectiveness will be greatest under MVS.

b) MVS has several sophisticated facilities for tuning the system that MVT lacked. UTCC´s MVS system was largely untuned and performance gains of 5-10% may be expected from this area.

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MVS RELEASE 3.7 BENCHMARKING RESULTS

cont´d

c) The High Speed Execution Batch Monitor is being extensively redesigned in order to increase throughput and decrease system overhead. Although no benchmarks are available yet, it is anticipated that the improvement will be significant.

Further benchmarking results will be published in COMPUTERNEWS as each of the above areas is investigated.

In conclusion, I would like to thank the benchmarking team, H. Arnaud, P. Young, J. Sutherland, G. Leb and W. Beattie for their efforts in generating the above results.

Walter Berndl

UPGRADE TO MVS

As part of the general expansion of computing potential at the University of Toronto, OS/370, Release 21.7, MVT, now running on the S/370-165-II General Purpose Job Stream, will be replaced on or about July, 1977 by an IBM MVS system. This change is being implemented for the following reasons:

1. This system upgrade will allow for future growth in computing capacity through the use of shared external storage and through load balancing with the second 370/165 which is being installed to handle the expanding student enrollment and administration work (see article above entitled ´The Advisory Committee Recommendations´). Dataset protection can also be considered for implementation under MVS.

2. IBM plans to drop support for UTCC´s current OS/MVT system in about a year´s time. Obviously this lack of support would create some difficulties when dealing with system or source language processor problems.

Since UTCC´s last attempt to install VS2, there has been a major rewrite of the system by IBM and UTCC test streams show considerable improvements over the earlier VS2 system.

Because of the problems experienced with VS2 in the past, UTCC has thoroughly modified and expanded its testing procedures. In addition, users will be given ´free day(s)´ on which they can try out the system. If the system fails to behave in a reasonable manner under a full user and if these problems cannot be corrected, there will be no further effort to implement it this year. If the system passes the ´free day´ test, it will be put up on a production basis. If it subsequently fails to behave in a reasonable manner as to throughput, response and turnaround, it will be withdrawn.

One of the problems in the last implementation was the introduction of a new accounting algorithm for the MVS system. This implementation of MVS will retain the existing algorithm to minimize changes experienced by individual users. The accounting algorithm will be reviewed at a later date.

UTCC anticipates that virtually all user jobs will run under the MVS system without change. However, with any major system change, the possibility always exists of a small number of job failures occurring. If the source statements of any failing program are available, UTCC will make every effort to help debug and convert the user´s program. In addition, if circumstances appear to warrant it, UTCC will make arrangements to run critical jobs under MVT so that no user need worry about being unable to meet a reasonable deadline due to the system upgrade.

Users with ´exotic´ programs or users having any doubts about a particular program who would like to have it run under MVS, should contact a Computing Co-ordinator or Herb Kugel at 978-7286.

Stan Yagi

BUILDING AND ROOM CHANGES

As might be expected the planned changes in machinery detailed in the article entitled ´The Advisory Committee Recommendations´ will necessitate a number of alterations to the rooms which will house the new equipment.

At present, it is planned that the bulk of the machinery will occupy the areas currently being used for the machine room, the tape-disk area, and the Sandford Fleming Terminal (SFT). The terminal will be moved east and will occupy the current rooms SF117, SF116, and SF114. The south-east corner of the building, presently occupied by room SF120 (keypunches and 2741 terminals) and the washroom, will be rennovated to house the advisors, keypunching, and stock. The 2741 terminals from this area will be combined with those presently in room SF145. Final details for the exact location of this terminal room are not yet available, but it will be on the first floor of the building.

The physical alterations to the building are considerable and may cause some inconvenience to the users of SFT. However, UTCC will attempt to keep any interruptions in service to a minimum.

Don Gibson

EXTENDED TEST-TIME

Because of the large amount of work involved in developing MVS, it has become necessary to extend the regular weekday test time slot by one hour. Effective February 1, 1977, test-time on the S/370-165-II will be regularly scheduled from 22:00 to 01:00. On those evenings when the entire three hour block is not needed, all excess time will be returned to normal user job production. The revised weekday schedule is as follows:

0000-0100 - SYSTEM TEST
0100-0600 - PRODUCTION
0600-0800 - SYSTEM MAINTENANCE
0800-2200 - PRODUCTION
2200-2400 - SYSTEM TEST

Users are reminded that any short-term adjustments to hours of operation will be announced in APL/SV HI message and the TSO Broadcast as well as in HOTNEWS. Changes in hours of operation will also be announced via Alert Notices which will be posted at all batch terminals.

UTCC attempts to avoid any deviations from normal schedules except in extreme circumstances. In such cases, announcements of schedule changes will be published by 1700 hours.

Derry Cox

REDUCED CLASS C RATES THIS SUMMER

UTCC will once again be offering CLASS C service at a reduced rate this summer. Highlights of the service will be as follows:

1. CLASS C service will be offered at a reduced rate from June 1 through September 30, 1977.
2. During this period the CLASS C memory charge will be reduced from the normal service factor of .75 times the standard memory charge to a service charge of .375, or one half of the regular CLASS C memory charge rate.
3. CLASS C service will be extended, where feasible, to before midnight on weekdays and, under certain circumstances, to weekends.

The exact specifications of all the options touched on by point 3 above, together with the CLASS C rules of memory availability, peripheral device allocation limits and time limits to be in effect this summer will be published in the May issue of COMPUTERNEWS. Users with questions or comments should contact Derry Cox at 978-7092.

Derry Cox

BLOCK TIME REQUESTS

Some users have suggested that UTCC make block time available to University of Toronto research users at reduced rates during times when the S/370-165-II would otherwise be idle (i.e., weekends or statutory holidays). UTCC responded to one such written request with the following proposal and is prepared to entertain research requests for this service.

The highlights of this block time sale are as follows:

- Block time would be available to University of Toronto research users at $125 per hour with an eight hour minimum.
- All charges for this block time would be made to one Customer Account Number - i.e. one research group per shift.
- The provision of this service will be contingent on the availability of idle time and an operator. The user would be expected to provide one person to be on the site with the operator during the shift.
- The user would have at his disposal the full compliment of UTCC's hardware and software during the shift. The use of output paper and cards would be available in modest amounts; UTCC would bill the user for supplies costs connected to larger-volume or special-forms consumption.

UTCC expects that one shift or more could be made available per weekend barring demands for machine time for maintenance, development or increased usage from the university community. Research users interested in discussing the above proposal further, should contact Derry Cox at 978-7092. If response to this service is such that scheduling contentions arise, more formal procedures will be published. Watch future editions of COMPUTERNEWS for further articles on this subject.

Derry Cox

ONLINE STORAGE

Another 3330 disk has been installed as an online pack on the S/370-165-II in response to a continuing demand for disk space. The amount of DASD available for external user allocation is now approximately 900 megabytes.

UTCC has been engaged in a maintenance project to compress existing USER online volumes in order to reduce pack fragmentation and clean up several VTOC problems which had resulted in the "disappearance" of several hundred tracks from the user pool. This clean-up plus the addition of the new pack should provide ample growth potential for the next few months.

Derry Cox

TELECOMMUNICATIONS ENHANCEMENTS

UTCC is in the process of writing some software modifications to the 3705 telecommunication controller which will enable users to dial one phone number to connect to any timesharing system in the host CPU to which the 3705 is connected. Thus, there would be only one phone number for SHARP APL and ATS on the S/360-65 and one phone number for the S/370-165-II, regardless of terminal type or speed. The lines will be dynamically assigned to a timesharing system, so that a line which is now dedicated to TSO 2741 use will become available for TSO teletypes as well as APLSV teletypes, WYLBUR 2471´s, etc. This will eliminate the problem of all TSO dial teletype lines being busy while almost none of the TSO 2741 lines are being used. The reduction in the number of ´wasted´ lines should result in a decrease in the number of phone lines connected to the 3705, thus reducing the cost of phone lines for UTCC.

The modifications described above will result in increased user convenience and system availability. The features resulting from these modifications should become available by the summer of 1977.

Doug Lacy

DECSCOPES REPLACE VUCOMS

UTCC has replaced many of its rented VUCOM CRT terminals with purchased VT52 DECSCOPES which are manufactured by Digital Equipment Corporation and marketed by another vendor.

The VT52 displays 24 lines of 80 characters, both upper and lower case. The keyboard includes a 19-key auxiliary keypad which can be used for numeric input and cursor positioning. Direct cursor addressing under host control is also provided.

UTCC received a quantity discount on the purchase of these displays and the vendor has agreed to offer displays at the same discounted price to users purchasing them through the University of Toronto. The vendor also provides maintenance for the VT52´s through a service contract or on a per call basis.

Users may examine a VT52 at the Advising Office, SF117, between 10 a.m. and 5 p.m., weekdays. For further information, contact Eugene Siciunas, SF113, 978-4967.

Eugene Siciunas

SAS 76

The latest release of the Statistical Analysis System, SAS 76, has recently been installed on the S/370-165-II. SAS 76 represents a major revision and enhancement of the previous version, SAS 72. SAS has both an easy-to-use, command-like language for users with little programming experience and a simple PL/1-like language capability for more complicated data manipulations. SAS also accepts virtually any form of input from any device type, including variable length records, and has facilities for easily creating, editing, sorting, transforming and concatenating datasets. It can read and convert SPSS, DATA-TEXT, BMDP and SAS 72 system files and can call BMDP programs directly.

Among the statistical procedures available, the least squares, linear and non-linear regression analysis and the analysis of variance are particularly versatile. In addition to the usual procedures available in other packages, SAS 76 offers a number of additional ones, including cluster analysis, probit analysis, spectral analysis and analysis of variance and covariance for nested designs.

To access the SAS 76 system in batch, use the procedure SAS as follows:

```
//job card(s)
// EXEC SAS [,OPTIONS=´options´]
//SYSIN DD *
     .
     .
  SAS control statements and data
     .
     .
/*
```

where ´options´ are those defined in _A User´s Guide to SAS 76_. A copy of this manual is available in the Information Office, SF128 and additional copies have been ordered.

The older version of SAS, SAS 72, is still available both on its own using the procedure SAS72 and under SAS 76 using the procedure SASBOTH. SAS 72 datasets will be renamed in conjunction with the installation of these procedures which should take place around the time that this issue of COMPUTERNEWS is mailed to you. An interactive version of SAS is available under TSO using the command SAS. For a brief description of the use of this command and its variations, enter ´help sas´.

Users with questions or problems related to SAS should contact John Roth at 978-6878.

John Roth

SPEAKEASY SESSIONS

The MU level of SPEAKEASY has arrived and is scheduled to become the default version on February 28, 1977. The current (LAMBDA+) level is expected to remain available as a non-default version until April 1, 1977.

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SPEAKEASY SESSIONS cont´d

The SPEAKEZ command or procedure should continue to be used and will at any time access the current version. As was explained in the November issue of COMPUTERNEWS, TSO users can access the non-default versions by special commands. Batch users need only code LEVEL= to access a version other than the default.

Users with problems or questions should contact Ian Darwin in room 303, 49 St. George, 978-7318.

Ian Darwin

WYLBUR WORDS

WYLBUR is a computer program useful for manipulating text files such as letters, manuscripts or computer programs. UTCC has, for some time, been modifying WYLBUR to comply with accounting procedures and dataset naming conventions and to ´interface´ with the UTCC HASP system on the S/370-165-II. These basic modifications are nearly complete and the system should be available in February as was announced in the November issue of COMPUTERNEWS. WYLBUR documentation is currently being prepared and should be available soon.

Users are asked to watch for further announcements concerning the availability of WYLBUR.

Ian Darwin

APLFULL PRINT TRAIN - FEBRUARY!

Due to production delays at IBM plants in the U.S.A., the delivery date of the APLFULL print train has been set back a full month. It is now expected that the print train will be delivered by February 25, 1977, at the latest.

The arrival of the new APLFULL print train will be announced in the APL sign-on HI message and in the SHARP APL HOTNEWS facility. To get the latest HEADLINE and item number, just type

```
)LOAD 1 HOTNEWS

NEWS n
```

where n is the item number appearing at the left of the headline.

The APLFULL print train is more than just another print train. With it, UTCC will be able to offer:

- a complete range of high-speed line printing capabilities to the SHARP APL and APLSV user
- up-to-date, convenient and total access to the DOCUMENTATION of the APL Public Library System
- formatted SOURCE listings (function definition) of APL program libraries at minimum cost and with a minimum effort
- better support and development work on the APL Public Library programs, since UTCC will now be able to have a better look at the code that it supports.

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APLFULL PRINT TRAIN cont´d

The following APL facilities are reviewed here in order to give users the best possible opportunity to become familiar with their use prior to the arrival of the APLFULL print train.

New SHARP APL PUBLIC LIBRARY CATALOG

The second edition of the SHARP APL PUBLIC LIBRARY CATALOG is now available in the SHARP APL workspace, 1 CATALOG. The new CATALOG index appears below.

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SHARP APL LIBRARY CATALOG INDEX
-------------------------------
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PAGES  8.1 -  8.47    (8)   TEACHING
PAGES  9.1 -  9.36    (9)   DEMONSTRATION AND GAMES
PAGES 10.1 - 10.108  (10)   ECONOMETRICS
PAGES 11.1 - 11.72   (11)   STATISTICS
PAGES 12.1 - 12.12   (12)   PROBABILITY
PAGES 13.1 - 13.20   (13)   FINANCIAL
PAGES 14.1 - 14.40   (14)   ENGINEERING
PAGES 15.1 - 15.5    (15)   NATURAL SCIENCES AND HUMANITIES
PAGES 16.1 - 16.5    (16)   ARITHMETIC
PAGES 17.1 - 17.5    (17)   POLYNOMIALS AND SPECIAL FUNCTIONS
PAGES 18.1 - 18.17   (18)   NUMERICAL INTEGRATION
PAGES 19.1 - 19.11   (19)   INTERPOLATION AND APPROXIMATION
PAGES 20.1 - 20.19   (20)   MATRICES
PAGES 21.1 - 21.7    (21)   NON-LINEAR EQUATIONS
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Updates to the CATALOG and the SHARP APL Public Library System are announced in the SHARP APL HOTNEWS facility. For further information on the CATALOG, refer to last month´s issue of COMPUTERNEWS or call DATATALK at 978-6710.

Users should note that APL graphics in the library documentation are simulated on the TN-STND print train by using the software supported translate table option of the SHARP APL FILEPRINT facility. For best results with the OFFLINE option, it is advisable to wait until the APL print train is available, although quite good results are available now.

New SHARP APL FILEPRINT Utilities

See last month´s issue of COMPUTERNEWS for a discussion of this facility. Detailed documentation is available from the SHARP APL CATALOG, Section 1, or in the workspace 1 FILEPRINT in the documentation variables, ABSTRACT and

SETUPHOW - use of function SETUP
MREQHOW - use of function MREQ
PRINTREQHOW - use of function PRINTREQ
PAGEHOW - page format control vectors for detailed page layout control
FORMSHOW - UTCC supported print forms and route print information
TRANSLATEHOW - how to use translate table options

Those intending to use the OFFLINE option to print the SHARP APL CATALOG should refer to the documentation in PRINTREQHOW in order to submit the print file to the high-speed line printer for printing with the APLFULL train. Users should note that the use of the APLFULL train is subject to the standard UTCC mount charge ($3.00 per mount).

High-Speed Automatic APL Workspace Listing

The availability of the APLFULL print train at UTCC removes forever one of the inconvenient aspects of using the APL programming language, namely, the problem of up-to-date workspace listings and workspace documentation.

cont´d...

APLFULL PRINT TRAIN cont´d

The automatic workspace listers in the SHARP APL and APLSV workspaces 4 WSL have been upgraded to accept an offline option which allows the high-speed line printing of the formatted APL source code on the APLFULL train.

Detailed documentation on how to use the workspace listers is available in the DESCRIBE variable in the SHARP APL and APLSV workspaces 4 WSL and in Section 4 of the SHARP APL CATALOG.

High-Speed Line Printing from APLSV

High-speed line printing from APLSV is an entirely new facility, being developed in order to allow the APLSV user full access to the APLFULL print train.

Although UTCC intends to fully support the APLSV high-speed PRINT facility for certain specialized applications (such as the automatic WSLISTERS in the workspace 4 WSL), it is felt that this facility is not ready for general use at the present time. Users with an interest in such a facility are invited to direct their comments to Ernst Goetze at 978-6710 or 978-6662.

Translate Tables and Buffer Loads

With the APLFULL print train, UTCC supports two new buffer loads with the forms codes

7cff APLFULL

and

8cff APL/ATS

See USERBOOK 3.2144 for an explanation of the codes c (carriage tape) and ff (forms).

The SHARP APL FILEPRINT facility and the APLSV high-speed line printing facility support fully compatible translate table options. A translate table developed for one system will work equally well for the other.

The concept of a translate table and buffer load is probably a new one to most APL users. Translate tables are a packed decimal integer representation of an assigned correspondence between APL character codes and the host system internal character representations. The use of these tables is an interesting application of APL, particularly since UTCC supports several print trains, including the two ALA trains.

If the APLFULL print train arrives on schedule, next month´s COMPUTERNEWS will contain an article explaining a guaranteed-to-succeed ´graphic approach´ to the design of APL translate tables. This ´graphic approach´ simplifies the whole process of designing APL translate tables for any buffer load and is fun to do, being somewhat like a very simple crossword puzzle.

Ernst Goetze

REVIEW OF THE HIGH SPEED JOB STREAM ACCESS CONTROL SYSTEM

On September 13, 1976, UTCC installed a High Speed Job Stream Access Control System (HSAC) on the HSJS. The system was designed to control and monitor High Speed Job Stream usage and to provide the Computer Centre with additional data useful for planning and resource allocation purposes.

The HSJS usage pattern has changed significantly since the introduction of the HSAC system. During the period from September 1976 through December 1976, 476,564 jobs were submitted, compared with 710,777 for the same period in 1975, a decrease of over 32%. It is interesting to note that HSJS job volume in the May to August period was approximately equal to that of the previous year.

While job volume has decreased, resource usage has increased. The typical HSJS job takes longer to execute, contains more cards and prints more lines. The following table summarizes the average resource utilization for HSJS jobs during the period September 1976 through December 1976 compared with the same period in 1975.

	Sept - Dec 1975	 1976	Change
CPU TIME (seconds)	.6816	.7422	8.9%
CARDS READ	108.9	125.1	14.9%
LINES PRINTED	167.2	196.6	17.5%
LINE/CARD RATIO	1.53	1.5717	2.3%

With the installation of the HSAC system, users have been using each run to the fullest and taking advantage of the debug options thus increasing the size of card decks and the amount of output generated.

The installation of the HSAC system has provided the Computer Centre with additional data for planning for future growth and services. Under the HSAC system, HSJS usage can be reported by class, by Service Access Code, by Customer Account Number and by department. During the period from September 1976 through December 1976, nine departments accounted for over 75% of the HSJS usage. All other departments ran fewer than 10,000 jobs each. A summary of HSJS use by department appears below:

Department of Computer Science	173,360
Scarborough College	44,265
Erindale College	32,832
Faculty of Applied Science & Engineering	31,124
Department of Electrical Engineering	26,751
Department of Civil Engineering	20,742
Department of Zoology	19,476
Department of Industrial Engineering	14,439
Department of Physics	10,770

No major problems have been encountered with the HSAC system. After the first week, the system ran smoothly. During the September - December 1976 period only 5% of all jobs run on the HSJS were flushed. 16% of these jobs did not contain a $NAME card on the first run, 72% did not contain a $ACCT card and the remainder were flushed due to invalid passwords or invalid or expired accounts.

Mark Tapia

ATTENTION SPSSQ USERS

A new version of SPSSQ which is compatible with version 6 of SPSS has been installed on the High Speed Job Stream. The installation of the new version of SPSSQ should eliminate the difficulties experienced by SPSS users who had to switch between the old version of SPSSQ (compatible with version 4 of SPSS) and the new version (version 6) of SPSS available on the GPJS.

The new version of SPSSQ is based on the mini version of SPSS called SPSSG. Unlike SPSSG, however, SPSSQ does not allow the user to access SPSS save files or archive files or to perform any input or output to devices other than logical units 5, 6 and 9 (unit 9 is used for the output from WRITE CASES). All output to unit 9 is directed to the printer and is included in the execution line and page limits.

Documentation on the new version of SPSSQ will appear in the USERBOOK module 3.6HSSPSSQ which is currently being updated. For documentation on SPSSG users should refer to Appendix D of SPSS Statistical Package for the Social Sciences Nie, Norman et al, 2nd edition. Any comments and/or questions related to SPSSQ should be directed to a Computing Co-ordinator or to Mark Tapia at 978-7109.

Mark Tapia

WATFIVS NOW AVAILABLE ON HSJS

WATFIVS, the structured version of the WATFIV compiler, is now available on the High Speed Job Stream. The structured constructs contained in WATFIVS help the user to produce programs which more closely reflect the logical structure of the algorithms being used. Another benefit of the WATFIVS compiler is the availability of the $INCLUDE feature. The use of a $INCLUDE card enables programs and data which have been placed in the WATFIV library to be retrieved and incorporated into the user´s deck. For example, professors can include test data in the library and require that students run their programs using the test data.

Users should note that the memory currently available to WATFIVS is about 24k, compared with the 75k which is available for the WATFIV compiler. This means that users with large jobs should run them under the WATFIV compiler. With the scheduled change to VS, however, the region available to WATFIVS will be increased to 75k, eliminating this problem.

WATFIVS is documented in the new USERBOOK module entitled 3.6HSWATFIVS which will be available in the near future. Questions or problems with WATFIVS should be directed to Mark Tapia in SF125, 978-7109.

Mark Tapia

PLUTO AND ASSIST SUPPORT TO BE DROPPED

Effective March 15, 1977, PLUTO and ASSIST will no longer be available on the High Speed Job Stream. PLUTO is a version of PL/I and ASSIST is an implementation of IBM/370 Assembly language.

The decision to remove these two processors from the HSJS was announced in the April 1976 issue of COMPUTERNEWS and at that time there were no objections made to this plan. Any users with comments concerning this move should contact Mark Tapia at 978-7109.

Mark Tapia

ATTENTION USERBOOK SUBSCRIBERS

All USERBOOK subscribers should have received by this time a profile listing of the USERBOOK modules they currently hold, as well as a letter explaining the procedure for renewing or cancelling their USERBOOK subscription. Subscribers are reminded that failure to return their profile listing to the UTCC Information Office, SF128 by February 15, 1977 will result in their USERBOOK subscription being cancelled. Any problems or questions should be directed to Don Gibson at 978-5568.

Don Gibson

EDUCATION SCHEDULE

UTCC will be offering two short courses which are scheduled to begin late in February. Enrollment for either of the courses will be restricted to those who have authorized use of a Computer Account Number (CAN). To register, please contact the Information Office, Sandford Fleming Building, Room 128, 978-4990.

Introduction to OS Job Control Language (JCL)

Prerequisite: The attendee should have some previous exposure to computing or at least be able to verbally define his/her particular requirements of the services available on the S/370-165-II.

Dates: February 21, 22, 23, 24, 25

Time: 5 - 6 p.m.

Instructor: M. Campbell

JCL is a set of control statements which must be supplied to the Operating System to give it the information required to initiate, process and complete a job or unit of work. These statements communicate details such as who the user is (CAN/SAC), what he/she wants done, how much time it will take, how much space is required, what devices will be involved, what data and problem-solving routines are to be used and where they are located and where the results are to be printed or stored. This course is intended to get the student started by presenting the basic JCL statements, their uses and coding rules.

cont´d...

EDUCATION SCHEDULE cont'd

Statistical Package for the Social Sciences (SPSS)

Prerequisite: Background in Social Science Statistics.

Dates: Feb. 28, Mar. 1, 2 and 4

Time: 4 - 5:30 p.m.

Instructor: J. Reece

For Social Sciences users who are, or will be, using the computer to process their data. SPSS is an applications-oriented programming language which contains powerful routines for the analysis of data while allowing users to manipulate their data with simple FORTRAN-like statements.

Marg Doherty

CUSTOMER SERVICE VIS-A-VIS COMPUTING CO-ORDINATORS

Because both the Computing Co-ordinator and the Customer Service Representative interface and consult with the user community, some confusion may exist as to their respective responsibilities. The following points should clarify any misunderstandings regarding the apparent overlap in the functions of these two groups. This clarification should help users to determine who to approach with a particular problem.

1. Programming Services Requirements

   Any projects involving systems analysis, design, or programming services should be referred to the Customer Service area, whereas technical programming problems (i.e. JCL, FORTRAN code, etc.), should be brought to the attention of the Computing Co-ordinators.

2. Estimating Requirements

   Computer resource estimates required for teaching purposes should be requested from the Computing Co-ordinators. Research grant estimates and estimates of computing funds for budget submission are handled by Customer Service.

3. Scope of Problem

   Day-to-day problems of an operational nature are generally serviced by the Computing Co-ordinator. Long-range problems or projects are the responsibility of Customer Service.

Hopefully, the above points will differentiate the roles of the two groups; however, if you have any questions, call Ralph Lombardi, Supervisor of Computing Co-ordinators, at 978-7130 or Bill Foster, Supervisor of Customer Service at 978-6021.

Bill Foster/Ralph Lombardi

NEW ADMINISTRATION MANAGER

I would like to extend a warm welcome to UTCC's new Administration Manager, Bert McNeil.

Bert has a masters degree in Engineering as well as an MBA and brings with him to the position of Administration Manager a great deal of experience in both the data processing and account management fields. He worked for IBM for three years as a Programmer, Systems Analyst, Time Sharing Supervisor and Marketing Representative. His next four years were spent at Multiple Access where he worked in Marketing and then as Account Manager. Two years each were spent at DEC and CDC where Bert worked as Senior Sales Engineer and Account Manager (DEC) and as a Consultant and Account Manager (CDC).

Bert can be contacted in room SF143, 978-8948.

Rein Mikkor

PERSONNEL CHANGES

John Krasnewitz has left his position of Peripheral Operator in Tape Disk and has been replaced by Adam Love who was previously working as an I/O Operator.

New at the Computer Centre this month are James Peacock, Jim Heifetz and Bert McNeil. James will be taking over Adam Love's position in I/O, Jim will be working as a Systems Programmer in Development and Bert is UTCC's new Administration Manager.

Best of luck to all of you in your new positions.

June Bridges

GPJS - SOFTWARE USAGE STATISTICS

The following chart summarizes the software usage per classified procedure and program name for the General Purpose Job Stream from December 1, 1976 to January 3, 1977.

SOFTWARE	USES (#JOBSTEPS)	(%)
ALGOL	64	0
APLSV	21	0
ASM	1,221	5
COBOL	869	3
CSMP	55	0
DATATEXT	124	0
DBUGUTIL	7	0
DISKUTIL	1,641	7
DSUTIL	3,461	14
DYNAMO	282	1
FORTRAN	6,942	28
GPSS	171	1
GRAPHICS	1,896	8
JCLUTIL	105	0
LISP	253	1
MARKEXAM	62	0
MARKIV	513	2
MPS/MPSX	71	0
OSUTIL	209	1
PAPERTAP	47	0
PL/I	1,604	6
RPG	53	0
SAS	90	0
SERVAID	177	1
SNOBOL	784	3
SORTMERG	1,201	5
SPEAKEZ	9	0
SPSS	1,937	8
SSP/BMDD	357	1
TAPEUTIL	316	1
TIPRS	50	0
TSO	51	0
XFR	288	1
TOTAL	24,931	

Kin Fong

S/370-165-II RELIABILITY

The reliability statistics for December indicate an uptime percentage of 99.3 while the average number of unscheduled IPL´s per day reached .48. The number of scheduled hours of production for December totalled 420.

MONTHLY COMPARATIVE FIGURES

MONTH	% UPTIME	UNSCHED. IPLs/DAY
Jan/76	99.1	0.43
Feb/76	98.9	0.97
Mar/76	96.8	1.03
Apr/76	99.3	0.52
May/76	98.8	0.67
Jun/76	96.5	0.97
Jul/76	96.4	0.72
Aug/76	99.4	0.47
Sep/76	98.4	0.86
Oct/76	96.9	0.83
Nov/76	98.2	1.10
Dec/76	99.3	0.48
1976	98.2	0.75

The percentage breakdown for total system downtime for December was:

HARDWARE:	22 minutes	(12.2%)
SOFTWARE:	157 minutes	(86.7%)
OTHER:	2 minutes	(1.1%)

The major events contributing to these downtime totals were as follows:

Dec. 1 - 102 minutes down - 3 IPL´s

a. 10 minutes attributed to a "no activity" condition on TSO - operator could not stop TSO without reloading the system.

b. 10 minutes resulted from a system enque which could not be resolved.

c. 92 minutes of corrective software maintenance to zap a purging high speed job which was causing HASP CATASTROPHIC ERRORS.

Paul Scarborough

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                    DOWNTIME_REPORT_ON___S/370__FOR_DEC_75


-----------------------------------------------------------------------------------------------------------------------------
|                                                     REIPLS(FREQ) // DOWNTIME (MN)                                         |
| DAY  REIPL   DNTIME 0    5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80   85   90   95  100|
======================+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+
| W  1     3     102  |□□□*************************************************************************************************** 102 |
| T  2     2      10  |□□********                                                                                          |
| F  3     1      10  |□*********                                                                                          |
| S  4     0       0  |                                                                                                    |
| S  5     0       0  |                                                                                                    |
| M  6     2      12  |□□**********                                                                                        |
| T  7     0       0  |                                                                                                    |
| W  8     1      10  |□*********                                                                                          |
| T  9     0       0  |                                                                                                    |
| F 10     0       0  |                                                                                                    |
| S 11     0       0  |                                                                                                    |
| S 12     0       0  |                                                                                                    |
| M 13     1      10  |□*********                                                                                          |
| T 14     0       0  |                                                                                                    |
| W 15     1      10  |□*********                                                                                          |
| T 16     0       0  |                                                                                                    |
| F 17     0       0  |                                                                                                    |
| S 18     0       0  |                                                                                                    |
| S 19     0       0  |                                                                                                    |
| M 20     0       0  |                                                                                                    |
| T 21     0       0  |                                                                                                    |
| W 22     1      10  |□*********                                                                                          |
| T 23     0       0  |                                                                                                    |
| F 24 (CENTER CLOSED)|                                                                                                    |
| S 25 (CENTER CLOSED)|                                                                                                    |
| S 26 (CENTER CLOSED)|                                                                                                    |
| M 27 (CENTER CLOSED)|                                                                                                    |
| T 28     0       0  |                                                                                                    |
| W 29     0       0  |                                                                                                    |
| T 30     1       7  |□******                                                                                             |
| F 31     0       0  |                                                                                                    |
-----------------------------------------------------------------------------------------------------------------------------


LEGEND        : ONE □  =ONE UNSCHED. IPL
                ONE *  =ONE MINUTE OF DOWNTIME

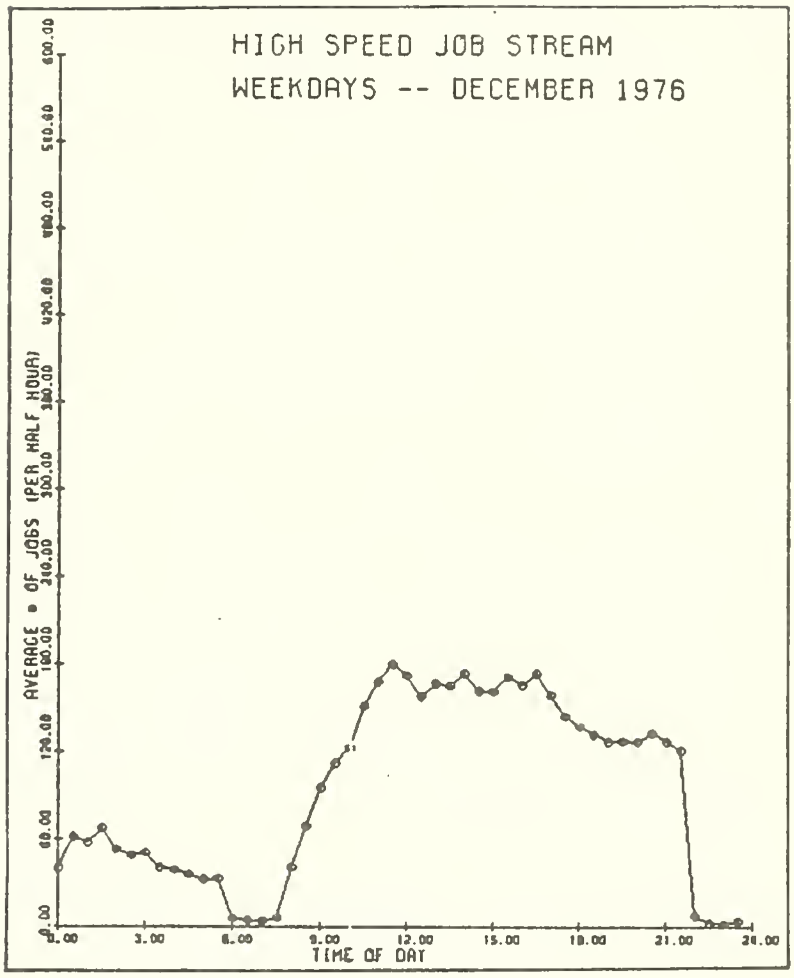
                TOTAL SCHEDULED HOURS OF PRODUCTION :  420
                TOTAL DOWNTIME (MN)   :  181 , AVG/DAY :    6.70 , AVG/PROD HOUR :    0.19
                TOTAL UNSCHED. IPL'S. :   13 , AVG/DAY  :    0.48
                DOWNTIME RATE IS      :  0.72 PERCENT OF SCHEDULED PRODUCTION HOURS
```

HSJS MONTHLY STATISTICS

During the month of December 1976, 92,559 jobs were processed compared with 126,991 jobs for the previous year, a decrease of 27.1%.

The following charts summarize the HSJS activity for the month of December. The graph represents the average number of jobs processed during each half hour period of the day.

Mark Tapia



RESOURCE_USAGE_BY_PROCESSOR

PROCESSOR	#USES	%TOTAL	TOTAL PER PROCESSOR CPU (MIN)	#CARDS READ	#LINES PRINTED	AVERAGE PER USF CPU (MIN)	#CARDS READ	#LINES PRINTED
WATFIV	27164	(29)	420.25	5788469	6395563	0.015	213	235
PL/C	26150	(28)	487.94	5274299	9362291	0.019	201	358
SP/K	22415	(24)	707.94	3735433	8345785	0.031	166	372
WATBOL	7644	(8)	114.69	684253	874935	0.015	89	114
UTILITY	2146	(2)	4.94	286420	439304	0.002	133	204
SIMON	1816	(1)	2.06	93479	112721	0.001	51	62
LISP	1544	(1)	24.94	294594	504896	0.016	190	327
SPSSQ	1111	(1)	16.25	149881	175902	0.015	134	158
SPITBOL	839	(0)	13.44	210002	255153	0.016	250	304
ASMG	601	(0)	16.75	136919	226086	0.028	227	376
ALGOLW	260	(0)	3.69	56148	75609	0.014	215	290
SNAP	111	(0)	1.25	3564	17935	0.011	32	161
UTILITY	72	(0)	0.06	7831	8545	0.001	108	118
ASSIST	38	(0)	0.38	18006	10153	0.010	473	267
$	36	(0)	0.13	2625	3003	0.003	72	83
PLUTO	11	(0)	0.00	2885	908	0.000	262	82
UTILITY	1	(0)	0.00	3	279	0.000	3	279
SP/KM	0	(0)	0.00	0	0	0.000	0	0
TOTAL	91959		1815.13	16744811	26809068	0.020	182	291

INTERACTIVE SYSTEMS RELIABILITY

The uptimes achieved for the month of December for each of APL and ATS were 98.58% and 98.63% of scheduled operation, respectively. The scheduled hours of operation during the month of December totalled 420, while the number of unscheduled IPL´s per day was 0.19. In addition to the scheduled time, Interactive Services were also available for approximately 130 hours of unattended weekend operation.

The percentage breakdown of total S/360-65 downtime for December was: hardware - 307 minutes (93.31%), Other - 22 minutes (6.69%). Five unscheduled IPL´s were required as a result of the system failures. The major events contributing to downtime were as follows:

DEC 6: 163 minutes of downtime was attributed to a process check in the CPU resulting in an unrecoverable hardware error. IBM was able to isolate a faulty card in register "E" which was subsequently replaced.

DEC 28: 95 minutes of downtime was attributed to storage data checks. Customer engineer replaced a bad card at location 01AD1K6.

The following table summarizes the time lost out of scheduled hours of production due to system failures for each of the systems.

DATE	DOWNTIME (MIN)		REASON
	APL	ATS	
Tue. Dec. 2	9	9	*Process check in CPU (Hardware)
Mon. Dec. 6	163	169	*Process check in CPU (Hardware)
Tue. Dec. 7	20	-	APL file subsystem abended (Software)
Wed. Dec. 15	12	12	*Process check (Low humidity)
Mon. Dec. 20	38	38	Tape drive malfunction during backups - late IPL (Hardware)
Wed. Dec. 22	5	5	Storage data check (Hardware)
Thu. Dec. 23	7	7	*IPL necessitated to recover HASP/HASP communication link. (Hardware)
Tue. Dec. 28	95	95	*Storage data check (Hardware)
TOTAL	349	335	*IPL required

System failures December 1 to December 31, 1976

Kam Jain

UTCC COMPUTER EQUIPMENT

SYSTEM/370 MODEL 165-II

- located in SF103/105/112
- provides General Purpose Job Stream, High Speed Job Stream, APL SV and TSO services
- 4 megabytes of memory
- 1 drum (2301)
- 18 disk drives (3330)
- 9 disk drives (2314)
- 6 magnetic tape drives (4 9-track and 2 7-track)
- 6 display consoles
- 6 printers
- 5 card readers
- 1 card punch
- 8 remote batch terminals
- 1 paper tape reader
- Calcomp plotters (11" and 30")
- Gould plotter (11")
- OS/MVT with HASP

SYSTEM/360 MODEL 65

- located in McLennan Physical Laboratories
- provides APL and ATS services
- 1536K bytes of core
- 26 disk drives (2314)
- 3 9-track magnetic tape drives
- 1 printer
- 1 card reader
- 1 card punch
- 140 typewriter terminals
- OS/MVT with APL and ATS

COMPUTER RESEARCH FACILITY

- located in SF207
- DEC GT44 System with
  - 1 PDP-11/40 CPU
  - 2 RK05 disk drives
  - 2 9-track dual density tape drives
  - 1 1000 cpm card reader
  - 1 300 lpm line printer
  - 1 220 lpm lower case line printer
  - 1 paper tape reader/punch
  - VT11 graphics display unit
  - Lab. peripheral system with A/D and D/A
  - 1 Digitizing Tablet (20" by 20")
  - 1 ZETA incremental plotter (11")
  - 1 CVI 260 Video Bandwidth Compressor
  - 1 CVI 261 Video Bandwidth Expander
- DEC GT40 System with
  - 1 PDP-11/05 CPU
  - 3 DIABLO disk drives (RK05 type)
  - 1 9-track/800 BPI tape drive
  - VT11 graphics display unit
  - 1 Digitizing Tablet (20" by 20")
  - Card reader and line printers shared with GT44

UTCC DIRECTORY

	ROOM	PHONE
ACTING DIRECTOR		
Rein Mikkor	SF116	5058
INFORMATION OFFICE		
General Inquiries	SF128	4990 or 4991
Marg Doherty	SF128A	8995
MANAGER, SERVICES		
Stan Yagi	SG200	7331
INFORMATION SERVICES		
Don Gibson	SF128	5568
SUPERVISOR, CUSTOMER SERVICES		
Bill Foster	SG301	6021
COMPUTING CO-ORDINATORS		
Sandford Fleming Terminal		
Mark Tapia	SF125	7109
Program Advisors	SF117	8599
Erindale		
Clem DiPlacido		828-5311
Scarborough		
Martin Hubel		284-3173
Arts and Science		
Jill Reece	SS2104	6509
New Physics		
Bob Chambers	NP1201	8823
SUPERVISOR, APPLICATIONS SUPPORT		
Herb Kugel	SG304	7286
MANAGER, OPERATIONS		
Derry Cox	SF113	7092
SUPERVISORS, OPERATIONS		
Paul Scarborough (S/370-165-II)	SF114	6220
Kam Jain (S/360-65)	NP333	7374
Dave Wong (S/370-155)		6864
MANAGER, SYSTEMS		
Rein Mikkor	SF116	5058
SYSTEM HARDWARE SUPERVISOR		
Eugene Siciunas	SF113	4967
MANAGER, COMPUTER RESEARCH FACILITY		
Dennis Smith	SF214B	4800
LAB CO-ORDINATOR (CRF)		
Krishna Patnaik	SF207	4086
ACCOUNTS		
Ann DeFazio	SF139	7148
Wynona Bardgett	SF139	8702
ACCESS CODES		
Yvonne Bowen	SF139	8703
MANAGER, INFORMATION SYSTEMS		
Sean Keeley		3579

NOTE:

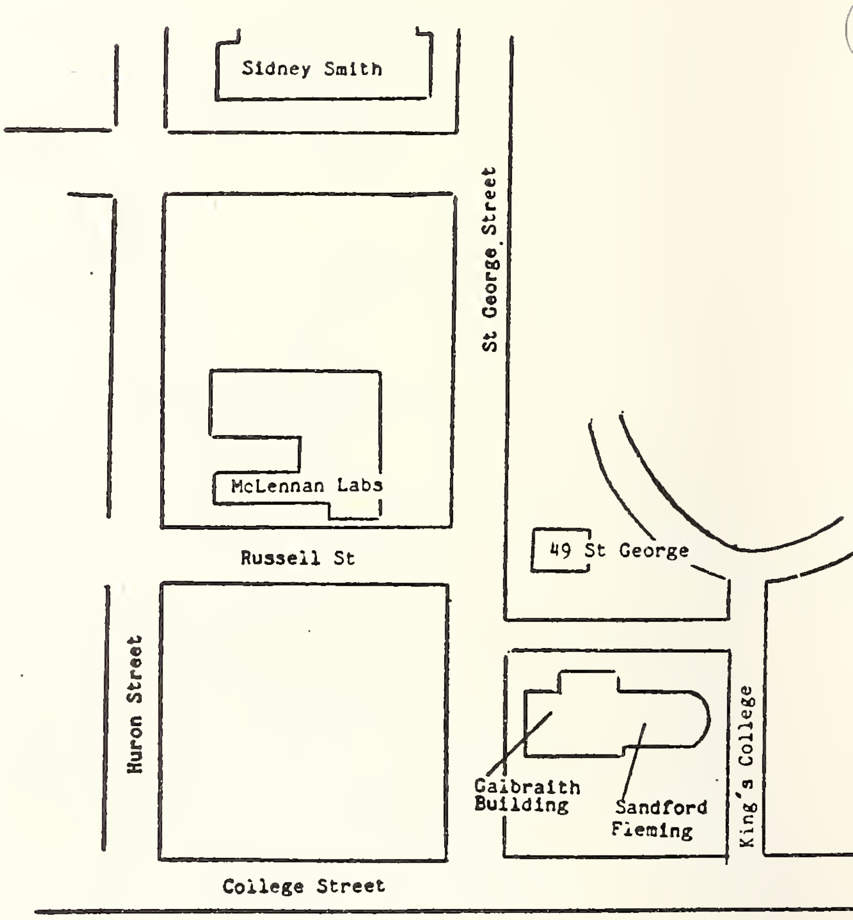
SF = Sandford Fleming
SG = 49 St. George
NP = McLennan Physical (New Physics)
SS = Sydney Smith

JOB AND SYSTEM STATUS QUERIES

SYSTEM/370,TSO	7373
ATS/APL	6234
2741 TERMINAL MALFUNCTIONS	7107
029 KEYPUNCH MALFUNCTIONS	6465

SERVICES

	DIAL-UP	ADVICE
APL - 2741	7200	6710
APL(ASCII	7200	6710
APL SV - 2741	7239	6710
APL SV - TTY	7447	6710
ATS	7100	7107
TSO - 2741	7303	8599
TSO - TTY (10 cps)	7390	8599
TSO - TTY (30 cps)	7386	8599
DATATALK	6710	6710



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